REMARKS

A/ Specification:

The specification was objected to because of an incorporation by reference.

However, the specification does not contain any incorporation by reference. It is thus believed that the objection was raised in error.

B/ Structure of the claim amendment:

- independent method claim 1 results from the merger of initial claims 1-3 and of the first paragraph of initial claim 4;

- independent method claim 11 results from the merger of initial claims 11-13;

- independent method claim 73 results from the merger of initial claims 1, 9 and 10;

- independent method claim 74 results from the merger of initial claims 11 and 14;

- method claims 75 and 76 depend on claim 74 and include the features that are in claims 16 and 17;

- independent method claim 77 results from the merger of initial claims 11 and 18;

- method claims 78-89 depend on claim 77 and include the features that are in claims 19-30;

- independent claims 90-94 are directed to a computer program product having instructions to specially carry out the method of claims 11 and 14-17 as amended;

- independent claims 95-97 are directed to a computer program product having instructions to specially carry out the method of claims 74-76;

- independent claims 98-110 are directed to a computer program product having instructions to specially carry out the method of claims 77-89.

Therefore, the amendment does not add any subject matter to the application.

C/ Claim rejections – 35 USC § 101:

Claims 1-30 have been rejected under 35 USC § 101 as they were considered to be directed to non-statutory subject matter.

Specifically, the examiner pointed out that the step of dividing an integer range into subsets, as recited in independent claims 1 and 11 in their original form, is not achieved by computer executable code.

By way of this amendment, the range division is no longer recited as a method step in each of the independent method claims 1, 11, 73, 74 and 77 present in the amended claim set, which is understood to address the examiner's concern. The same kind of wording has been used in the independent claims relating to computer program products.

This feature defines structure of the data which is used in the method according to the invention. It is cited in the introductory parts of the independent claims in order to provide support for the terminology used in the following parts of the claims.

It is thus requested that the 35 USC § 101 rejection be reconsidered.

D/ Claim rejections – 35 USC § 102 and 103:

Independent claims 1 and 11 have been rejected under 35 USC § 102(e) as their subject matter was considered to lack novelty over Ozbutun (US Patent 6,067,540).

Ozbutun relates to a method of segmenting bitmap indexes. Referring to Fig. 3a-b, the examiner has found that it discloses dividing a range covering integers of an input

list into subsets. In the example discussed by Ozbutun (col. 5, l. 58-65), the row-ID range 1-5000 is divided into three subsets 1-999, 1000-2999 and 3000-5000.

For each subset, a data structure 304, 306, 308 is generated, including a key value ("M"), the lower and upper bounds of the subset which consists of a sub-range and a bitmap index to designate those rows of the data table which contain the key value. As noted by the examiner, such data structures 304, 306, 308 may be viewed as coding data including, for each subset including at least one integer of the input list (i.e. each sub-range of rows including at least one occurrence of <key value>), data (<start-rowid>, <end-rowid> in col. 5, l. 35) representing the position of said subset, and data (<bitmap>) representing the position of each integer of the input list within said subset.

The pattern used by Ozbutun for dividing the integer range (0-5000) into subsets is generally not predetermined as claimed. Fixed-length (sub-)ranges, which make it unnecessary to indicate the upper bound <end-rowid>, are mentioned although they are not recommended (col. 5, l. 47-50). Still, the division pattern is not predetermined since it remains necessary to encode the lower bound <start-rowid> of the sub-range. The sub-range position data <start-rowid> and/or <end-rowid> refers to the position of the sub-range in the whole range (0-5000), not in a predetermined pattern as claimed.

According to the amended claim 1, the position of each subset in the pattern is represented by an integer rank which is included in the coding data. Ozbutun does not use such ranks as sub-range position data, and if he did, his system would not work because it allows for gaps (col. 6, l. 1-10) depending on the contents of the data table.

This is a first difference between the subject matter of claim 1 and Ozbutun's teaching.

In addition, claim 1 as amended recites providing a coding data container comprising records having respective addresses for storing together the coding data produced from the input lists of a plurality of integer lists, each record of the coding data container having a first field for storing an integer rank related to the pattern, a second field for storing

an address value for another record of the data container and a third field for storing a bitmap segment.

This feature was not disclosed or suggested by Ozbutun.

It was originally in claim 4 which was rejected under 35 USC § 103(a) in view of Ozbutun. The examiner has deduced his rejection of claim 4 from the fact that Ozbutun discloses the creation of segmented bitmaps to reduce consumption of database system resources. This reasoning is respectfully traversed. First, Ozbutun considers the case of only one "integer list" (occurrences of "M" within rowid range 0-5000) and is silent about how to handle multiple lists. Second, Ozbutun discloses storing each bitmap segment as a separate entity, along with information (i.e. <start-rowid>, <end-rowid>) of which range of records the bitmap segment covers (col. 5, l. 27-29). This is 180° opposite to the claimed feature of providing a coding data container for storing together the coding data produced from the input lists of a plurality of integer lists. Third, Ozbutun's data structure does not have the claimed first and second fields for storing an integer rank related to the pattern and an address value for another record of the data container.

It is thus submitted that the method of claim 1 is both novel and non-obvious over Ozbutun.

Claim 1 is thus allowable, as well as claims 4-6, 9 and 10 which depend thereon.

We have seen that Ozbutun's range division pattern is not predetermined. Fixed-length sub-ranges are presented as unfavorable. Independent method claims 11 and 73 as amended specify that, in the pattern, the subsets are consecutive intervals consisting of the same number of integers (original claims 9 and 12). Even though such a case is mentioned by Ozbutun, the reference would rather have dissuaded those skilled in the art to use it.

The amended claims 11 and 73 further specify that said number of integers is a whole power of 2. This feature was originally in claims 10 and 13 which were rejected under 35 USC § 103(a) in view of Winters (US Patent Application 2003/0167373).

It is respectfully pointed out that the Winters reference is a patent application filed on February 28, 2003 based on a provisional application 60/360,833 filed on March 1, 2002, whereas the present application was filed on December 13, 2000 with convention priority of November 29, 2000. Hence Winters is not prior art in the present case, and the rejection of original claims 10 and 13 is not a proper one.

Claim 11 and 73, whose scope is that of original claims 13 and 10, respectively, are believed to be allowable, as well as claims 14-30 which depend thereon.

Claim 74 recites, for each coding layer, the step of storing the coding data produced for said layer in first and second files having a common addressing. For each subset containing at least one integer of the input list of said layer, the data representing the position of said subset in the pattern are stored in the first file and the data representing the position of each integer of the input list within said subset are stored at a corresponding address in the second file.

Claim 74 corresponds to original claim 14 which was rejected under 35 USC § 103(a) in view of Okada (US Patent 5,995,098). Yet, the examiner has recognized that the combination of Ozbutun and Okada fails to disclose the feature of claim 14.

Okada discloses a personal information environment system. The examiner has relied on Fig. 4 and the comment therof in col. 6, l. 44-50. Fig. 4 shows a display on a screen of a dialog box, not how the displayed data are stored in memory. Okada's Fig. 4 merely shows a screen display including a bitmap field. Okada does not teach or suggest storing bitmaps separately from data representing subset positions in a pattern as claimed.

In contrast, Ozbutun discusses how to store bitmap indexes. As pointed out hereabove, Ozbutun stores each bitmap segment as a separate entity, <u>together</u> with information (<start-rowid>, <end-rowid>) of which range of records the bitmap segment covers (col. 5, l. 27-29), and also with a key value (col. 5, l. 34-35). Hence, Ozbutun teaches away from the claimed feature of storing the coding data in two distinct files, one for the position data and on for the bitmap data. In Ozbutun's system, there is an interest in manipulating each bitmap segment independently relative to the other bitmap segments (col.

3, l. 39-41), but there is no incentive to store the constituent data of the "bitmap segment" (as detailed in col. 5, l. 35) in distinct files in order to manipulate them separately.

It is thus submitted that original claim 14 was defining a patentable method. The corresponding amended claim 74 is believed to be allowable, as well as claims 75-76 which depend thereon.

Claim 77 corresponds to original claim 18 which was rejected under 35 USC § 103(a) as being "unpatentable" in view of Ozbutun alone.

It relates to an encoding method with $n \geq 2$ successive coding layers. There is a multi-layer hierarchy, with a predetermined pattern in each layer. No such hierarchy is disclosed or even suggested by Ozbutun. It is not readily compatible with Ozbutun's storage of the bitmap segments as "separate entities".

According to claim 77, layer k data containers each having a plurality of records are provided in a computer memory for $1 \leq k \leq n$. Each record of a layer k data container is associated with a layer k integer rank representing the position of a subset in the layer k pattern. Nothing remotely similar to such container/rank association appears in Ozbutun, and it cannot be seen how one skilled in the art would have been incited to provide such association.

Claim 77 further specifies that each record of a layer k data container associated with a layer k rank representing the position of a subset in the layer k pattern has a first field for containing data for retrieving the position within said subset of any integer of a layer k input list relating to a layer 1 input list, whereby a combination of said layer k rank with any position retrievable from the data contained in said first field determines a layer k–1 rank with which a respective record of the layer k–1 data container is associated if $k > 1$, and an integer of said layer 1 input list if $k = 1$. This has no relationship with Ozbutun's teaching. No connection can be made with the mere observation, made by the examiner, that Ozbutun discloses the creation of segmented bitmaps to reduce consumption of database system resources. It is thus requested that the examiner reconsiders his rejection of claim 18 or at least explains more specifically where its features would be suggested by Ozbutun.

It is submitted that original claim 18 was defining a patentable method. The corresponding amended claim 77 is believed to be allowable, as well as claims 78-89 which depend thereon.

Claims 90-110 relate to computer program products suitable for carrying out the methods of claims 11, 14-17 and 74-89, respectively. They include the same technical features as these method claims, and are believed to be allowable essentially for the same reasons.

E/ Conclusion:

The application is believed to be in condition for allowance.

Prompt allowance of the application is respectfully requested.

Dated: September 21, 2004

Respectfully submitted,

By _____

Thomas A. Miller
Registration No.: 40,091
MARSHALL, GERSTEIN & BORUN LLP
233 S. Wacker Drive, Suite 6300
Sears Tower
Chicago, Illinois 60606-6357
(312) 474-6300
Attorney for Applicant